

# Follicles in competition

SIR — Competition for the privilege of ovulation there certainly is, but to accept as chief candidates, as Daedalus does, the left and right ovaries, “locked in endocrine poker” (*Nature* 362, 502; 1993), is imaginative to a serious fault. Biological objects important to Jim Watson may have come in pairs, but the pairedness of a woman’s ovaries demands no more mystical an explanation than anatomical symmetry plus a dab of insurance (should one twist on its pedicle and fail). Many fish, birds and bats do perfectly well with one<sup>1</sup>.

The participants in the competition to ovulate each month are, in any case, much more than two. They consist of all those oocyte-bearing follicles, distributed across both ovaries, with between about 75,000 and 375,000 granulosa cells by the end of the previous luteal phase<sup>2</sup>. What Daedalus divines as each ovary “raising its level of hormonal bidding, until one of them feels outbid, and folds”, need be no more than stochastic stumbling between two ovaries which, for virtually all physiological purposes, act as one.

Competition among the follicles during a woman’s life is, on the other hand, tough. Before the first ovulation, the oocyte population has fallen from 2 million at birth to 300,000 (ref. 3). If every cycle is ovulatory from then to the menopause, when almost no follicles are left, just 500 to 700 follicles will qualify each month. Each follicle hangs on central control by the hypothalamus and pituitary gland through the pituitary hormone, follicle-stimulating hormone (FSH). This, not the other ovary, is the command centre that needs to be convinced that there is a dominant follicle extant. Once that is done, and the dominant follicle has sequestered enough FSH to keep growing with much less new FSH than its neighbours, nothing more mysterious is needed to override the control than a constant dose of administered FSH. That is what we as specialists in infertility do every day of the week to induce multiple follicular development for helping conception with *in vitro* fertilization.

In natural ovarian cycles, FSH levels rise at menstruation to encourage growth of a new cohort of follicles (numbering perhaps 50 in the early 20s, maybe five at 40, probably just one at 48); then, as follicles respond and grow further, FSH levels fall — depriving more and more follicles of the FSH needed to stay in the race. The follicular signals that DREADCO’s endocrinologists will be looking for are those that diminish FSH at just the right rate to leave just one victorious follicle (but often two follicles, sometimes three) still growing. The contenders for Daedalus’s ‘Anova’, the putative endocrine bid for supremacy, are directed not

to the other ovary but centrally, and include the steroid hormone oestradiol, the well-known peptide inhibin<sup>4</sup>, and a substance called gonadotrophin surge attenuating factor<sup>5</sup>, known only to be not a steroid and to have a molecular weight between 10,000 and 30,000.

On the other hand Daedalus’s intended infertility treatment ‘Binova’ — his “biochemical misère bid (to) convince each ovary that the other has folded (so that) both will therefore produce an ovum that month (and) double the subject’s chance of pregnancy” — has been known for years: the oestradiol-antagonist clomiphene<sup>6</sup>. More effectively, though, we override the subtleties of inhibitory control with, simply, injections of FSH.

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## Why Africa said no

SIR — The African Academy of Sciences, in its dissent from a resolution on population growth passed by all but three of the 15 academies from the developing world assembled in New Delhi, showed more enthusiasm for politics than for science (see *Nature* 366, 3; 1993).

The World Bank’s 1993 World Development Report shows the total of 24 countries of Africa south of the Sahara to have an overall 46 per cent of population under 15 with a total fertility rate of 6.4. Their high population growth rates have resulted in declining food production per caput for the past 20 years. Their best efforts to feed their peoples and to provide them with schools and with hospitals have been continuously overwhelmed by population growth.

The African Academy raised the question of “the contribution of the North to Africa’s population predicament”. This contribution has, for a century, been the very effective assistance in the reduction of death rates through medical services, clean water supply and agricultural progress. Unfortunately this help has been accompanied, until recently, by a confused reluctance to assist in the reduction of birth-rates. These African governments have in recent years shown awareness of

the problem and have invited cooperation from the United Nations, bilateral and nongovernment organizations in the development of family planning services. Thus although a small group of academic officials have made a political gesture, “Africa” has definitely not said “no” to a reduction in fertility rates.

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## CNRS defended

SIR — As directors of research of the French Centre National de La Recherche Scientifique (CNRS) we regret the negative impression you give of this research organization (*Nature* 365, 95; 1993). Any national body of this kind comes in for criticism from a few individuals who do not agree with the assessment of their work by scientific committees, or who object to the relocation of their laboratories for practical reasons. For the CNRS, with more than 11,000 researchers, who are in the privileged position of having permanent contracts, it is essential that the processes of scientific review and on occasion consequent closure of laboratories and reorientation of personnel should be carried out correctly. Scientists and laboratories are reviewed every two years by national committees whose members are nominated by the CNRS and elected by the scientific community.

In our experience, this process functions properly. We do not know of any scientist who has been dismissed for publicly criticizing government policy or the administration of research. Scientists can be dismissed for proven professional misconduct, but this is very rare. A lot of effort on the part of the scientific administrators is put into trying to revitalize flagging researchers. In the past the CNRS has been criticized for being too easy-going; with budgetary restrictions and a lot of good young scientists applying for jobs, the review committees have become “tougher”. This can only be beneficial, even if it is resented by some sections of the community.

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